

REMARKS/ARGUMENTS

Reconsideration of this application and entry of this Amendment are solicited. Claims 1, 2 and 4-12 are currently pending in the application.

It is proposed to amend claims 1 and 8, the two independent claims in the case, to specify a range for the reduced pressure, namely 200 to 1 Torr. Basis for this may be found in the description of the invention, for instance at page 8, lines 20-21 while specific amounts are indicated in Examples 1-3. This Amendment serves to reduce issues, more precisely define the methods being claimed and advances examination.

The current Official Action cites and applies for the first time U.S. 5,993,612 to Rostaing et al which is applied in combination with a secondary reference which is already of record. Accordingly, applicants have not had the opportunity to address this newly cited primary reference. In overview, the relevance of this newly cited reference is no more pertinent than prior art previously considered and in any event the claims now under review are patentably distinguished from the disclosures of this document considered alone or even in combination with the previously cited Breitbarth et al citation.

In the claimed invention, an exhaust gas, which is discharged from production equipment, such as a semiconductor manufacturing facility, is directly introduced into an excitation unit. Since the exhaust gas is already partially-excited when it is discharged from the production equipment and introduced into the excitation unit, it is possible to use less energy to maintain the exhaust gas at an excited state.

For example, in the case of treating the exhaust gas at the rate of 1 liter/minute, although the amount of energy required to generate plasma according to the present invention is about 1.5 kW, the amount of energy required when degrading exhaust gas at the rate of 1 liter/minute by again generating plasma under reduced pressure after tentatively discharging at atmospheric pressure using the invention disclosed in Japanese Patent Unexamined Application, First Publication No. H10-277354, was 5.5 kW. Namely, use of the method of the present invention makes it possible to reduce the amount of energy required for plasma generation to about 30% of that of the prior art.

By contrast Rostaing et al do not teach that the exhaust gas is partially-excited before being introduced into the excitation unit.

Although the Examiner argues in the Office Action that "Rostaing et al teaches that as the gas exits the production equipment, it flows through a high frequency field applicator device (column 4, line 54) for the purpose of exciting the gas before reaching the hollow dielectric tube (and excitation unit), ...", the fact is the exhaust gas discharged from the production equipment does not flow through the high-frequency field applicator device 10 in the process of purifying a gas of Rostaing et al.

Instead, Rostaing et al describe the high-frequency field applicator device 10 stating that "The surface-wave exciter 10, also called a high-frequency field applicator, consists of an applicator of the surfatron guide type which, in conjunction with the waveguide 12, guides the microwave radiation that is created by the microwave generator 14 to the discharge tube 16 in order to create a plasma 18 in the gas to be purified." (column 4, lines 62 to 67).

On a more careful reading of the reference it will be apparent the exhaust gas does not flow through the high-frequency field and therefore the exhaust gas is not partially-excited before being introduced into the excitation unit.

In the claimed invention, the exhaust gas is reacted with a reaction remover in the form of a viscous flow under a reduced pressure of 200 to 1 Torr. Since the exhaust gas discharged from the production equipment is introduced into the excitation unit under a reduced pressure of 200 to 1 Torr, it is possible to prevent the reaction between the exhaust gas and the reaction remover from forming solid reaction products that cause clogging of the tube. Therefore, the claimed invention enables the exhaust gas to be transported through comparatively narrow lines, and also enables the space required for setting the tube connecting the first pump of the production equipment and the excitation unit to be reduced, and enables the diameter of the treatment tube 43 to be narrowed down, thereby making it possible to reduce the size of the plasma treatment unit 41.

Again, in contrast Rostaing et al do not teach the exhaust gas is under a reduced pressure of 200 to 1. Rostaing et al describe that the exhaust gas is at to atmospheric pressure in Claim 1.

Therefore, the claimed invention, that is independent claims 1 and 8 (as above amended), is different from the respective disclosures of Rostaing et al and Breitbarth et al, and the prominent effects of the claimed invention as explained above cannot be obtained even by combining Rostaing et al with Breitbarth et al.

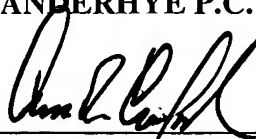
OHMI ET AL.
Appl. No. 10/587,266
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For the above reasons it is respectfully submitted that the claims of this application define patentable subject matter. Entry of this Amendment and allowance are solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By:



Arthur R. Crawford
Reg. No. 25,327

ARC:eaw
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100